



3Com® 5500G Open Services Networking Module

Getting Started Guide

www.3Com.com

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Introduction

Get the latest documentation and software for your 3Com OSN|M

Thank you for purchasing the 3Com® OSN|M Open Services Networking Module. As part of our commitment to help you get the most out of your 3Com network equipment, we offer updated documentation and software on our web site.

To obtain the most up-to-date user documentation and operating software for the 3Com OSN|M, point your web browser to: **www.3Com.com** and select the “Support and Registration” link.



You must register your 3Com switch to receive software upgrades. To register, point your web browser to **eSupport.3Com.com**.

About this guide

This guide provides all the information you need to install the 3Com® Open Services Networking Module with your 3Com Switch 5500G. It is intended for network administrators who are responsible for installing and setting up network equipment; consequently, it assumes a basic working knowledge of LANs (Local Area Networks).

Notice Icons

Table 1 lists important conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information note	Information that describes important features or instructions
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, or device
	Warning	Information that alerts you to potential personal injury

1 OSN|M Overview

You can use the Open Services Networking Module (OSN|M) as an expansion module installed in an expansion module slot on the rear panel of a Switch 5500G. It provides a software and hardware platform that can run various services. After an OSN|M is inserted into the expansion module slot, it interacts with the switch through its two internal service interfaces, which conforms to the software and hardware interface specifications defined by OSN.

An OSN|M runs an independent Linux system. To configure and maintain this system, you can log in using several methods.

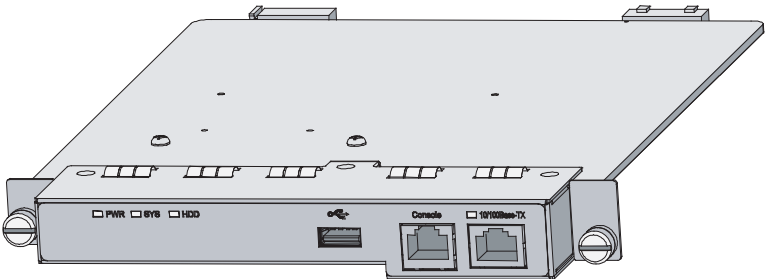
You can develop and load service software on the OSN system to implement security, management, and network optimizing applications on the switch. This allows you to implement and run multiple application types on the same device, therefore facilitating network and service deployment and reducing overall cost.

2 OSN|M Hardware Overview

Appearance

Figure 1 displays the front view of the OSN|M.

Figure 1 OSN|M appearance



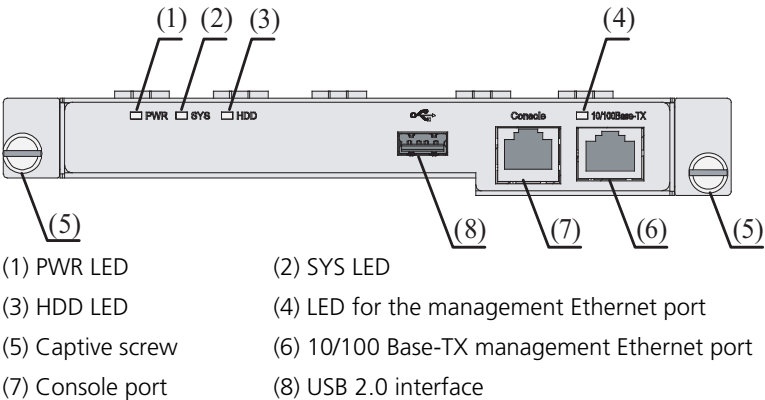
Front Panel

This section describes the OSN|M's front panel.

Front Panel View

An OSN|M provides one USB 2.0 interface, one console port, and one 10/100 Base-TX management Ethernet port. Figure 2 illustrates the front panel of an OSN|M.

Figure 2 OSN|M front panel



LEDs There are PWR, SYS, HDD, and management Ethernet port LEDs on the front panel of an OSN|M. Table 1 describes the four LEDs.

Table 1 The OSN|M front panel's LED descriptions

LED	Color	Status	Function
PWR	Green	Green, solid ON	Normal
		Green, blinking	The module is being loaded.
		OFF	The module is powered off.
SYS	Green/Red	Green, solid ON	CPU bus is busy
		Red, solid ON	CPU bus fails.
		OFF	CPU runs normally.
HDD	Green	Green, blinking	Hard disk is reading/writing.
		OFF	Hard disk does not perform any operation.
LED for the management Ethernet port	Green/Yellow	Green, solid ON	100-Mbps connection is established.
		Green, blinking	100-Mbps connection is established and data is being received/transmitted; Active
		Yellow, solid ON	10-Mbps connection is established.
		Yellow, blinking	10-Mbps connection is established and data is being received/transmitted; Active
		OFF	No connection is established.

Interface Specifications

Console port

The console port on the OSN|M's front panel conforms to the EIA/TIA-232 asynchronous serial port specifications. You can use the console port to log into and then configure the OSN|M's Linux system. Refer to Table 2 for the console port specifications.

Table 2 Console port specifications

Specification	Description
Connector type	RJ45
Number of connectors	1

Table 2 Console port specifications

Specification	Description
Interface standard	EIA/TIA-232
Cable type	Asynchronous serial port cables
Baud rate (bps)	<ul style="list-style-type: none"> ■ 300 ■ 1200 ■ 2400 ■ 4800 ■ 9600 (default) ■ 19200 ■ 38400 ■ 56000 ■ 115200

Management Ethernet port

You can use the 10/100Base-TX management Ethernet port on the OSN|M's front panel for management only; not for exchanging data. Use this port to log into the OSN|M's Linux system through SSH, and then to configure the Linux system. Refer to Table 3 for the management Ethernet port specifications.

Table 3 Management Ethernet port specifications

Specification	Description
Connector type	RJ45
Number of connectors	1
Interface standard	IEEE 802.3u
Cable type	Category 5 cables (forward compatible)
Working mode	<ul style="list-style-type: none"> ■ Full/half duplex ■ 10/100 Mbps autosensing
Supported frame format	<ul style="list-style-type: none"> ■ Ethernet_II ■ Ethernet_SNAP

USB interface

Use the USB interface on the OSN|M's front panel to connect a storage medium such as a USB flash disk to perform file related operations. Refer to Table 4 for the USB interface specifications.

Table 4 USB interface specifications

Specification	Description
Connector type	USB interface
Number of connectors	1
Interface standard	USB 2.0 (backward compatible)
Transmit rate	<ul style="list-style-type: none">low-speed mode: 1.5 Mbpsfull-speed mode: 12 Mbpshigh-speed mode: 480 Mbps
Working mode	<ul style="list-style-type: none">Half duplexHost mode

Hardware Configuration

Table 5 describes the hardware components of the OSN|M.

Table 5 OSN|M hardware configuration

Specification	Description
CPU	Celeron M1.0G 373 processor
Memory	512 M
Hard disk	80 G



CAUTION: Do not replace OSN|M hardware components yourself. Doing so can damage the module.

Table 6 describes the hard disk's default partitioning.

Table 6 Default partitioning of the OSN|M hard disk

Partition name	Mount point	Format of file system	Function
/dev/hda1	/	ext3	The Linux root file system. When you choose to boot from the hard disk using Elilo, it uses this partition as the system's root file system. The volume label of this partition is <i>/</i> .

Table 6 Default partitioning of the OSN|M hard disk

Partition name	Mount point	Format of file system	Function
/dev/hda2	/alt	ext3	The root file system's backup partition. Its leave-factory setting is null.
/dev/hda3	swap	swap	The Linux system's swapping partition. When you boot from hard disk using Elilo, it uses this partition as the system's swapping partition.
/dev/hda5	/opt	ext	The partition provided for the users. It is the system's largest partition. System, files are not saved on this partition.
/dev/hda6	vboot	vfat	The Linux system's boot partition. The boot loader Elilo can identify the vfat partition only. The Linux kernel and ramdisk file are stored on this partition.

3 OSN|M Installation

Installing and Removing the OSN|M

The Switch 5500G supports hot swapping the OSN|M.



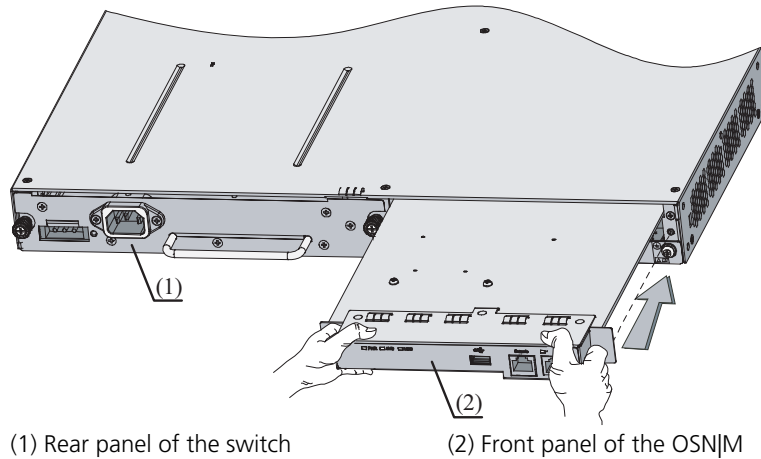
CAUTION: *If the Linux system is running on an OSN|M, use the **poweroff** command to exit the system before removing the OSN|M.*

Installing an OSN|M in a Switch 5500G

To install the OSN|M, perform the following steps:

- 1 Put on an ESD-preventive wrist strap and make sure that the ESD-preventive wrist strap is properly grounded. Then take the OSN|M out of the package.
- 2 Unscrew the mounting screws on the switch's expansion module filler panel and remove the filler panel.
- 3 Hold the two sides of the OSN|M front panel with both hands, and slide in the OSN|M along the guide rails until the OSN|M is fully inserted into the switch as shown in Figure 3.
- 4 Use a screwdriver to fasten the fastening screws on both sides of the OSN|M.

Figure 3 Install an OSN|M in a switch



Removing the OSN|M

- 1 Put on an ESD-preventive wrist strap and ensure that the ESD-preventive wrist strap is properly grounded.
- 2 Loosen the fastening screws on both sides of the OSN|M using a screwdriver.
- 3 Hold the two sides of the OSN|M front panel with both hands and draw back the module until the module is fully separated from the switch.



CAUTION:

- Hold the two sides rather than the middle of the OSN|M front panel to install or remove the OSN|M. Otherwise, the OSN|M may be out of shape.
- Do not apply excessive force to install or remove an OSN|M, and do not touch the surface-mounted components directly with your hands.
- After removing an OSN|M, if no new module is to be installed, install the filler panel in time to prevent dust and ensure normal ventilation in the switch.

Connecting the Management Ethernet Port Cable

To connect the management Ethernet port cable, perform the following steps:



CAUTION: When connecting the cable, pay attention to the mark on the interface to insert it in the correct direction, otherwise, you may damage the interface or the OSN|M.

- 1 Connect the management Ethernet port to a terminal.
 - If the terminal to be connected is a PC or router, use a crossover cable to connect the management Ethernet port to an Ethernet port of the PC or router.
 - If the terminal to be connected is a HUB or switch, use a standard cable to connect the management Ethernet port to an Ethernet port of the HUB or switch.
- 2 Power on the OSN|M and check the LED for the management Ethernet port on the OSN|M's front panel. ON means a link is present. OFF means no link is present. If the LED is OFF, check the line for the cause.

4 Logging Into the OSN|M Linux System

Login Options

You can log into the OSN|M Linux system through:

- The OSN|M's console port.
- The OSN|M's management Ethernet port using SSH.
- The OSN|M's internal service interface using SSH
- A serial port redirection after you log into the switch. You can connect to the switch's OSN|M or to another switch's (within the same fabric) OSN|M to which you have logged in through a CLI.

After you connect to the OSN|M's Linux system, you need to input the correct username and password. The default username and password are both **root**.

Logging In Through the Console Port

In this example, a PC acts as a terminal. Connect the terminal's serial port to the OSN|M's console port through the configuration cable.

- 1 Connect the configuration cable's DB-9 female connector to the PC's serial port, and the cable's RJ-45 connector to the OSN|M's console port.
- 2 Start the PC and run a terminal emulation program such as the Windows HyperTerminal. Select the connection mode **COM** and set the following terminal parameters:
 - Bits per second: **9600**
 - Data bits: **8**
 - Parity: **none**
 - Stop bits: **1**
 - Flow control: **None**

You can now power on the OSN|M and log into its Linux system through the PC's terminal emulation program.

Logging In Through the OSN|M Management Ethernet Port Using SSH

The SSH server function is enabled on the OSN|M by default. You can use SSH on the SSH client to log into the Linux system through the OSN|M's management Ethernet port performing the following steps:

- 1 Connect one end of the cable to the switch's Ethernet port and the other end to the OSN|M's management Ethernet port.
- 2 Power on the OSN|M and log into the OSN|M's Linux system by executing the **ssh2** command on the switch. The management Ethernet port's default IP address is 192.168.0.2/24.

Configuration Example

Create a VLAN interface on the switch and assign it an IP address. The IP address is used as the SSH client address to connect the SSH server.

```
<sysname> system-view
[sysname] interface vlan-interface 1
[sysname-Vlan-interface1] ip address 192.168.0.56 255.255.255.0
[sysname-Vlan-interface1] quit
```

Establish the SSH connection to the SSH server (OSN|M) 192.168.0.2.

```
[sysname] ssh2 192.168.0.2
Username:
```

Enter the username and password. The default username and password are both **root**.

```
Username: root
Trying 192.168.0.2 ...
Press CTRL+K to abort
Connected to 192.168.0.2 ...
```

```
The Server is not authenticated. Do you continue access it?(
Y/N):y
Do you want to save the server's public key?(Y/N):y
Enter password:
Last login: Sun Jan  2 11:48:42 2005 from 192.168.0.56
[root@localhost ~]#
```

You have logged into the Linux system and can configure and manage that system.

Logging In Through the OSN|M Internal Service Interface Using SSH

After you install the OSN|M into the Switch 5500G's expansion module slot, the OSN|M exchanges information with the switch through its two internal service interfaces, which display as Eth0 and Eth1 in the Linux system.

The Switch 5500G provides two internal ports GigabitEthernet 1/1/1 and GigabitEthernet 1/1/2 to connect with Eth0 and Eth1. Eth1 can be used as an external interface when the OSN|M serves as the SSH server. The default IP address of Eth1 is 10.10.10.6/24.

As shown in Figure 4, you can connect an SSH client with the OSN|M resident switch or another switch in the fabric containing the OSN|M resident switch, and then use SSH to log into the OSN|M's Linux system through the OSN|M's Eth1 interface.

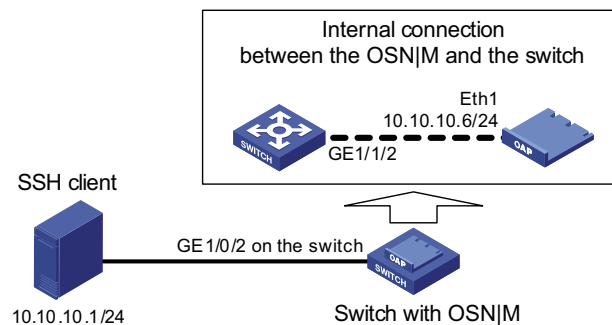


A Switch 5500G Ethernet switch provides two internal ports, GigabitEthernet 1/1/1 and GigabitEthernet 1/1/2, to connect to the OSN|M. Do not perform any configuration except to disable the Spanning Tree Protocol (STP) on GigabitEthernet 1/1/1, and do not perform any configuration on GigabitEthernet 1/1/2 except to allow a VLAN to pass.

Configuration Example

Network diagram

Figure 4 Logging in through the OSN|M's internal service interface Eth1 using SSH



Configuration procedure

- 1 Ensure network connectivity between the SSH client and the OSN|M's Eth1 interface.
- 2 Configure the SSH client's IP address and that of the Eth1 interface to be on the same network segment. The IP address of Eth1 is 10.10.10.6/24 by default.
- 3 Add the following two switch ports to the same VLAN:
 - The port connected with SSH client, GigabitEthernet 1/0/2 in this example.
 - The port connected with OSN|M's Eth1, GigabitEthernet 1/1/2 in this example.

After completing the above configuration, run the SSH client program on the SSH client, and input the IP address of Eth1 as the SSH server address. You can log into the OSN|M's Linux system after the connection is established.

Logging In through a Switch 5500G Command Line Interface

You can log into a switch through a console port or an Ethernet port, then connect to the switch's OSN|M or to another switch's (in the same fabric) OSN|M. In this case, if the Linux system on the OSN|M is running, the control terminal interface on the switch will switch from the command line interface (CLI) to the Linux system operating interface. After the switchover, you can return to the CLI of the switch using the shortcut key **Ctrl+K**.

To connect to the OSN|M's Linux system, use the **OSM connect unit unit-id** command. This command is available in user view.



- *For instructions on configuring the OSN|M on a switch, refer to 3Com Switch 5500G OSN|M Configuration and Command Reference Guide.*
- *If you load services software on the OSN|M, you need to enable certain protocols such as the Application Control Forwarding Protocol (ACFP) and ACSEI for information interaction on the OSN|M resident switch. For details, refer to 3Com Switch 5500G OSN|M Configuration and Command Reference Guide.*

Configuration Example

On the switch, use the **osm connect** command to connect to the OSN|M's Linux system.

```
<Sysname> osm connect unit 1  
Connected to OSM !  
Fedora Core release 6 (Zod)  
Kernel 2.6.18.8 on an i686
```

```
localhost.localdomain login:
```

Enter the username and password. The default username and password are both **root**.

```
localhost.localdomain login: root  
Password:  
Last login: Sun Jan  2 12:52:22 on ttyS1  
[root@localhost ~]#
```

You have logged into the Linux system and can now configure and manage the system.

5 Understanding and Using the BIOS Options

BIOS Menu

Entering the BIOS Menu

When the OSN|M is powered on, the following information is displayed:

```
*****
*
*          BIOS , Ver 1.17          *
*
*****
Copyright(c) 2005-2007 by 3Com Corporation.
Compiled date: Nov 22 2007 13:47:17
CPU type      : Intel(R) Celeron(R) M processor
CPU L1 Cache  : 32KB
CPU L2 Cache  : 512KB
CPU Clock Speed : 1000MHz
Memory Type   : DDR2
Memory Size   : 512MB
Memory Speed  : 400MHz
BIOS Size     : 1024KB
Hard Disk Size : 80GB
HardWare Version is 1.00
```

Press CTRL-D in 5 seconds to enter BIOS Menu...

To enter the BIOS menu, press **Ctrl+D** when Press Ctrl-D to enter BIOS Menu... appears.

If you are logged into the OSN|M's Linux system, you can execute the **reboot** command to reboot the OSN|M, and then press **Ctrl+D** when Press Ctrl-D to enter BIOS Menu... appears to enter the BIOS menu.

```
[root@localhost ~]# reboot
```

If the Linux system is shut down, the following information is displayed:

```
INIT: Sending processes the TERM signal
INIT: Sending processes the KILL signal
```

```

Shutting down smartd: [ OK ]
Stopping yum-updatesd: [FAILED]
Stopping atd: [ OK ]
Stopping cups: [ OK ]
Shutting down console mouse services: [ OK ]
Stopping sshd: [ OK ]
Shutting down sm-client: [ OK ]
Shutting down sendmail: [ OK ]
Stopping acseic-daemon: [ OK ]
Stopping acpi daemon: [ OK ]
Stopping crond: [ OK ]
Shutting down RPC idmapd: [ OK ]
Stopping autofs: Stopping automount: [ OK ]
[ OK ]
Stopping system message bus: [ OK ]
Stopping NFS statd: [ OK ]
Stopping portmap: [ OK ]
Stopping PC/SC smart card daemon (pcscd): [ OK ]
Shutting down kernel logger: [ OK ]
Shutting down system logger: [ OK ]
Shutting down hidd: [ OK ]
Stopping Bluetooth services: [ OK ]
Shutting down interface eth0: [ OK ]
Shutting down interface eth1: [ OK ]
Shutting down interface eth2: [ OK ]
Shutting down loopback interface: [ OK ]
Starting killall: [ OK ]
Sending all processes the TERM signal...
Sending all proc
Saving random seed:
Syncing hardware clock to system time
Turning off quotas:
Unmounting pipe file systems:
Unmounting file systems:
Please stand by while rebooting the system...
Synchronizing SCSI cache for disk sdb:
Synchronizing SCSI cache for disk sda:
ACPI: PCI interrupt for device 0000:01:00.1 disabled
ACPI: PCI interrupt for device 0000:01:00.0 disabled
Restarting system.
.

```

After waiting for several seconds, the system starts the BIOS and displays the boot information.

BIOS Menu Options

Press **Ctrl+D** when Press Ctrl-D to enter BIOS Menu... appears, and the system displays the BIOS menu.

```
<1> Boot Linux From HardDisk
<2> Boot Linux From USB
<3> Install Linux OS With Ethernet
<4> Enter Internal Shell
<5> Reboot
Enter your choice (1-5) :
```

Table 7 describes the menu options.

Table 7 BIOS menu

Menu item	Description
<1> Boot Linux From HardDisk	Read the boot program from hard disk and then boot the Linux system.
<2> Boot Linux From USB	Read the boot program from the storage medium connected to the USB interface, and then boot the Linux system.
<3> Install Linux OS With Ethernet	Install the Linux system through Ethernet
<4> Enter Internal Shell	Enter the Internal Shell command line.
<5> Reboot	Reboot the OSN M.

Booting the Linux System

This section describes the BIOS menu boot options

Booting the Linux System from the Hard Disk

The system boots the Linux system from the hard disk in the following conditions:

- During the BIOS boot process, if you do not perform an operation within five seconds.
- During BIOS boot process, if you do not select an option but press **Enter**, the system operates according to menu item 1 (booting the Linux system from hard disk).
- If you enter **1** at the BIOS menu, the BIOS reads the boot program from the hard disk to boot the Linux system.

Booting the Linux System from the USB Storage Medium

If you enter **2** in the BIOS menu, the BIOS reads the boot program from the storage medium connected to the USB interface to boot the Linux system.

This function provides a shortcut to rapid system restoration. You can backup part of the system installation files into an external storage medium, such as a USB flash disk. When the system cannot be started normally due to system kernel file damage, you can use the backup system files stored in the external storage medium to boot the Linux system, and then enter the Linux system to locate the problem.

The files that you need to back up include: Initrd, bzImage, and elilo.efi. For a detailed description of these files, refer to Table 8 on page 30.

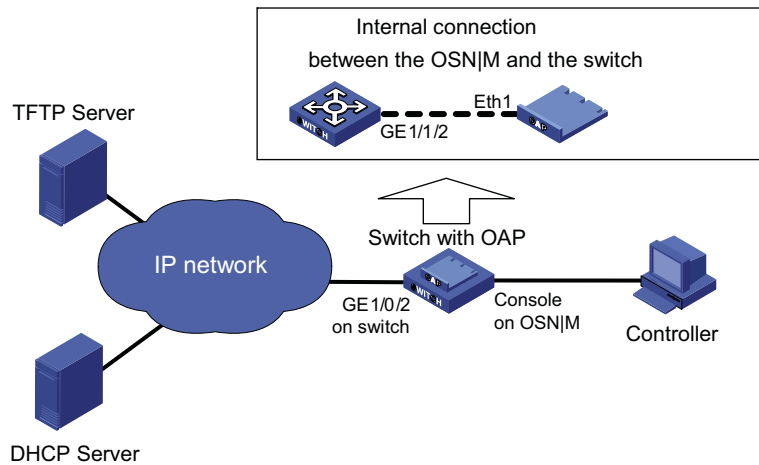
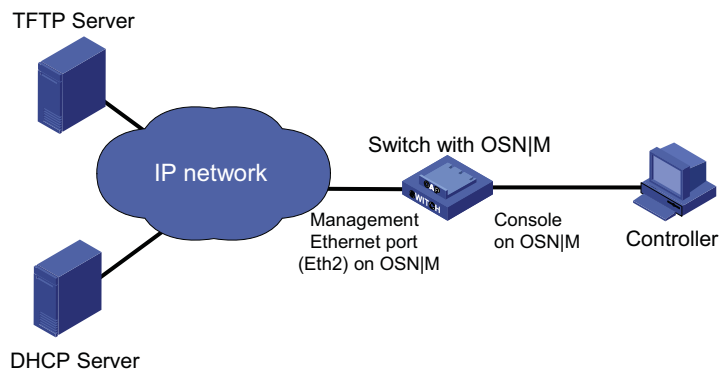
Installing the Linux System through an Ethernet Connection

If you enter **3** in the BIOS menu, the system installs the Linux system through the Ethernet port. This option downloads the Linux system files from a server to the OSN|M for installation. During the installation process, the OSN|M's hard disk is formatted and partitioned, and therefore, the original data on the hard disk is lost. Make sure to use the Ethernet installation function with caution. The OSN|M module supports address auto-configuration through DHCP.

Network Diagrams

Install an OSN|M in a Switch 5500G. The controller can enter the BIOS menu of the OSN|M using several methods to execute the Ethernet installation of the Linux system. Figure 5 shows the network diagram and installation process for an Ethernet installation. In this example, the controller logs into the OSN|M module through the console port install the Linux system using an Ethernet connection. You can install the Linux system through the two network cards on the OSN|M module.

Figure 5 shows an Ethernet installation through the internal interface Eth1 on the OSN|M module.

Figure 5 Network diagram for an Ethernet installation through Eth1**Figure 6** Network diagram for Ethernet installation through the management Ethernet port Eth2

Configuring the TFTP Server

Complete the following configuration procedure on the TFTP server:

- 1 Ensure that there is network connectivity between the TFTP server and the switch installed with the OSN|M module.
- 2 Enable TFTP on the TFTP server, and store the configuration file and the installation files listed in Table 8 on the TFTP server. (These files are

available with the software releases.) Create a directory named **3CR17280-72** on the server, and put the configuration file in this directory.

Table 8 The Linux system installation files

File name	Description
initrd	The ramdisk file generated by busybox.
bzImage	The kernel file generated by busybox.
elilo.efi	Linux boot loader
elilo.conf	ELILO configuration file
disk.tar.gz	Mirror image file of the hard disk
Vfat.tar.gz	Kernel file of the Linux system, needs to be stored on the vfat partition.

- 3
- Modify the contents of the configuration file. The configuration file is used to boot the system and download the required installation files. The configuration file contains the names and paths of the installation files on the TFTP server, for example:
- BZIMAGEFILE=setup/1.06/bzimage
- INITRDFILE=setup/1.06/initrd
- ELILOEFIFILE=setup/1.06/elilo.efi
- DISKFILE=setup/1.06/disk.tar.gz
- VFATFILE=setup/1.06/vfat.tar.gz

In each of the above examples, on the right of the equal sign, the path for the installation file stored on the TFTP server is displayed. Make the relevant modifications based on the TFTP server's configuration.



Caution:

- The configuration file is in UNIX format.
- Put the configuration file in the directory called **3CR17280-72**.
- Make sure that the path for the installation files in the configuration file is consistent with that on the TFTP server.
- In the configuration file, the equal sign and the content on the left cannot be modified.
- 4
- Modify the name of the configuration file. The OSN|M module automatically matches the configuration file according to its MAC

address and IP address. For example, when obtaining the configuration file from the TFTP server, the OSN|M module with the IP address 10.10.10.1 and MAC address 00-00-12-34-56-79 matches the configuration file in the following order:

- a** Searches file 01-00-00-12-34-56-79 under directory \3CR17280-72;
- b** If no such file is found, searches file 0A0A0A01 (0A0A0A01 is the hexadecimal format of the IP address of the OAP module);
- c** If no such file is found, searches file 0A0A0A0;
- d** If no such file is found, searches file 0A0A0A;
- e** If no such file is found, searches file 0A0A0;
- f** If no such file is found, searches file 0A0A;
- g** If no such file is found, searches file 0A0;
- h** If no such file is found, searches file 0A;
- i** If no such file is found, searches file 0;
- j** If no such file is found, searches file default (the default configuration file).

With the above matching process, you can manage the configuration files in a hierarchical way based on the actual networking. For example, the network segment 10.10.0.0/16 uses the configuration file 0A0A; the network segment 10.10.10.0/24 uses the configuration file 0A0A0A; the device with the IP address 10.10.10.1/26 uses the configuration file 0A0A0A01.

Configuring the DHCP Server

To configure the DHCP server, perform the following steps:

- 1** A DHCP server can assign an IP address for the client dynamically.
- 2** You are required to configure the IP address of the TFTP server on the DHCP server for the OAP module to download the configuration file. The configuration method and priority are as follows:
 - a** If Next server IP address is configured for the DHCP server, it is taken as the IP address of the TFTP server;
 - b** If no Next server IP address is configured for the DHCP server, but TFTP Server Name (Option 66) is configured, TFTP Server Name is taken as the address of the TFTP server;

- c If neither Next server IP address nor TFTP Server Name (Option 66) is configured for the DHCP server, the OAP module considers that the DHCP server can also serve as the TFTP server, and takes the IP address of the DHCP server as the IP address of the TFTP server.
- 3 The following example shows the DHCP server's configuration file's content. Configure the DHCP server on the Linux system, and the content of the configuration file on the DHCP server as follows:

```
ddns-update-style interim;
ignore client-updates;

subnet 10.10.10.0 netmask 255.255.255.0 {
    range dynamic-bootp 10.10.10.20 10.10.10.100;
    default-lease-time 21600;
    max-lease-time 43200;
    filename "pxelinux.0";
    #option tftp-server-name "10.10.10.1";
    next-server 10.10.10.1;
}
```

Ethernet Installation Procedures



CAUTION: During the Linux system Ethernet installation, the OSN|M hard disk is formatted and partitioned, and therefore the original data on the hard disk is lost. Make sure to use the Ethernet installation function with caution.

- 1 Enter the BIOS menu (for detailed procedures, refer to “BIOS Menu Options” on page 27), and select **3** to select Ethernet installation.

```
<1> Boot Linux From HardDisk
<2> Boot Linux From USB
<3> Install Linux OS With Ethernet
<4> Enter Internal Shell
<5> Reboot
Enter your choice(1-5):3
```

The system automatically connects to the DHCP server to obtain its own IP address as well as the TFTP IP address. It then connects to the TFTP server to download configuration and installation files. It then loads the kernel and ramdisk files. The `/ #` prompt indicates that the file loading is complete.

- 2 When `/ #` appears, type the command `pxe_install` and press Enter to execute the Ethernet installation script. The installation process takes about 20 minutes and displays the following messages as it proceeds.


```

/ # pxe_install
Try to do network install on eth1.....
Get the ip address from dhcp-server.....
udhcpc (v1.6.0) started
Sending discover...
Sending select for 10.10.10.91...
Lease of 10.10.10.91 obtained, lease time 21600
Get TFTP server IP address from DHCP by NextServer
The TFTP server IP address is: 10.10.10.10
Get config file setup/3CR17280-72/01-00-00-12-34-56-7
9.....Fail
Get config file setup/3CR17280-72/0A0A0A5B.....Fail
Get config file setup/3CR17280-72/0A0A0A5.....Fail
Get config file setup/3CR17280-72/0A0A0A.....OK
fdisk harddisk.....OK
mkfs of sda1.....OK
mkfs of sda2.....OK
mkfs of sda3.....OK
mkfs of sda5.....OK
mkfs of sda6.....OK
download vfat file(1.06/vfat.tar.gz).....OK
decompress vfat file(vfat.tar.gz).....OK
download disk file(1.06/disk.tar.gz).....OK
decompress disk file(disk.tar.gz).....OK
install hard disk OK
install completed
/ #

```

- 3** After the installation, execute the **reboot** command to reboot the OSN|**M**:

```
/ # reboot
```

Do not interrupt the system while it is booting; until the following messages appear.

```

Fedora Core release 6 (Zod)
Kernel 2.6.18.8 on an i686

```

```
localhost.localdomain login:
```

- 4** Enter the username and password to log into the Linux system.

A complete Linux file system is installed on the hard disk.



The first time you boot the system after an Ethernet installation, file system checking occurs, which consumes more time than usual. Make sure to wait until all system checking is complete before continuing.



After the kernel file and ramdisk file are loaded, the system prompts / #. In this case, you can use the **fdisk** command to view the Linux file system and to perform file operations or manually update system files. System restoration or upgrades in this way does not result in reformatting the hard disk.

Entering the Internal Shell Command Line

Enter **4** in the BIOS menu to enter the Internal Shell command line.

```
Enter your choice(1-5):4
Shell>
```

You now have administrator rights and can perform file system operations on the hard disk's files.



Operations performed through the Internal Shell command lines may affect the normal working of other items. 3Com recommends that you do not to log into and use this system.

You can use the **reset** command to exit the Internal Shell command line.

```
Shell> reset
```

After executing the **reset** command, the system reboots the BIOS.

Upgrading the BIOS

After entering the Internal Shell command line, you can use the command in Table 9 to upgrade the BIOS:

Table 9 Upgrading the BIOS

To ...	Use the command...	Remarks
Upgrade the BIOS	bios update -s { eth1 eth2 } <i>local-host-IP-address</i> <i>TFTP-server-IP-address</i> <i>btm-file-name</i>	Required

You can use the **bios update -s eth1** command to use the interface Eth1 on the OSN|M module that connects the switch to upgrade the BIOS, or use the **bios update -s eth2** command to use the management Ethernet port (Eth2) on the front panel of the ONS|M module to upgrade the BIOS.

local-host-IP-address: IP address of the selected interface on the ONS|M module, that is, the IP address of Eth1 or Eth2.

TFTP-server-IP-address: IP address of the TFTP server selected.

btm-file-name: Name of the installation file (a .btm file).

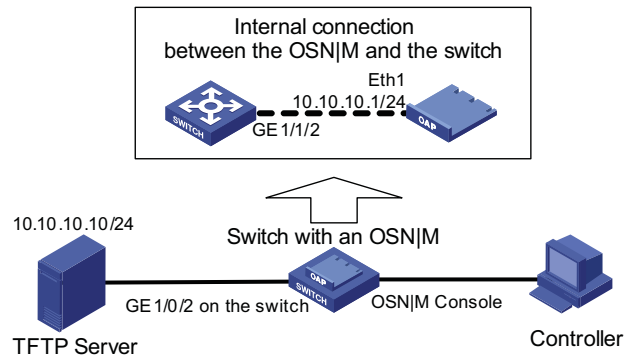
The TFTP server and the selected ONS|M interface must be on the same network segment.

Upgrading the BIOS Through Interface Eth1

Network diagram

Install the ONS|M module in a Switch 5500G. You can log in to the Linux system of the ONS|M module to enter the Internal Shell command line and upgrade the BIOS using one of several methods. The example in Figure 7 shows the network diagram for installing and upgrading the BIOS. To follow this example, log into the ONS|M module through the console port to perform BIOS upgrade through Eth1.

Figure 7 Network diagram for upgrading the BIOS through Eth1



Configuration procedure

Use **linux-bios117.BTM** command to upgrade the BIOS through Eth1.

```
Shell> bios_update -s eth1 10.10.10.1 10.10.10.10
linux-bios117.BTM
Please wait! Loading.....done!
Erasing Flash .....done!
Writing flash
.....done!
Update BIOS from file linux-bios117.BTM success!
Shell>
```

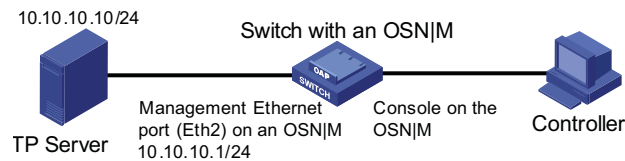
After completing the BIOS upgrade, you can use the **reset** command to exit the Internal Shell command line and restart the BIOS.

Upgrading BIOS Through Eth2

Network diagram

Install the OAP module in an S5600 switch. Controller can log in to the Linux system of the OAP module to enter the Internal Shell command line to upgrade the BIOS in many ways. The following exemplifies the network diagram and installation process of BIOS upgrade. In this example, Controller logs in to the OAP module through the console port to perform BIOS upgrade through Eth2.

Figure 8 Network diagram for upgrading the BIOS through Eth2



Configuration procedure

Use linux-bios117.BTM to upgrade the BIOS through Eth2.

```

Shell> bios_update -s eth2 10.10.10.1 10.10.10.10
linux-bios117.BTM
Please wait! Loading.....done!
Erasing Flash .....done!
Writing flash
.....done!
Update BIOS from file linux-bios117.BTM success!
Shell>
  
```

After completing the BIOS upgrade, you can use the **reset** command to exit the Internal Shell command line and restart the BIOS.